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XIII.

LIVINGSTONE'S NILE—WHAT IS IT?

By A. J. Russell, C. E.

(Communicated April 27, 1874.)

[This paper is devoted to an investigation of the problem of the Lualaba, with the view of showing, by a critical examination of the facts known at the time the paper was written, that the Lualaba is probably the Congo and not connected with the Nile system.]

Now that the reported death of Livingstone is confirmed, and the great explorer has been cut off before completing the enterprise to which he so heroically devoted himself, we naturally inquire: In what condition has he left the great problem of African hydrography he was engaged in resolving, and what is the aspect it bears? Is the mighty River Lualaba, with its great lakes, that he discovered, really the Nile, or, if not, what is it?

If his latest journal has been preserved, perhaps it may contain his last conclusion on the subject, or throw further light on it. Should his journal be lost it will be difficult fully to appreciate the value of the service rendered to society by Stanley in finding Livingstone and bringing out so much valuable information as to his discoveries, and the portion of his journal contained in the sealed parcel addressed to his family, which possibly might not otherwise have been preserved.

It is true that the information that Stanley communicated was necessarily imperfect, and that the maps given in explanation of it conflict materially in parts with what is contained in Livingstone's letters, when carefully collated. But then it is to be borne in mind that Livingstone himself was still groping his way, and, from well-grounded objections to the erroneous manner in which his former notes had been worked up, intended reserving for himself the task of setting before the public his discoveries and final conclusions after verifying them to his own satisfaction. Nevertheless, in full appreciation of the generous sympathy of Stanley and his mission, he liberally communicated to him such ample information as to his discoveries as to enable him to give that interesting general summary of them which his work affords.

It is unnecessary to dilate on Livingstone's discoveries in Africa; they far exceed, in extent and importance, those of any other explorer of that continent. Passing over his earlier explorations, farther south, we may glance briefly at those pertaining to our present subject — his supposed Nile.

About four or five hundred miles south from Speke's great heart-shaped lake, the Victoria Nyanza, which hangs downward from the equator, and nearly the same distance from the east coast of Africa, rises the River Chambezi, flowing westward toward the interior, a little north of latitude 12° south. From the area it apparently drains, and the humidity of the climate, it may be as great a stream as the Elbe in Saxony. On traversing its valley downward, instead of finding it to be, as its name seemed to show, the upper course of the great river Zambezi, which falls into the Mozambique channel opposite the island of Madagascar, it led him to the discovery of the great lake Bangueolo into which the Chambezi falls.

Lake Bangueolo lies about midway across the continent along the north side of the line of latitude 12° south, with a length from east to west of at least a hundred and fifty miles, Livingstone says, and a breadth of about seventy, covering an area probably larger than that of lake Ontario.

The river Chambezi is the commencement of the great river which Livingstone believed, on further exploration of its waters, to be the Nile. Leaving the north side of lake Bangueolo with greatly increased volume of water, and under the name of Luapala, he traced it northward through a smaller lake, Moero, and then by alternate great courses of northing and westing, for some six or seven hundred miles, to another large lake called Kamelondo, where it receives on the west the river Lufira, a large branch from the south. From lake Moero downward the main stream is called the Lualaba (indicating it to be a lacustrine river, a term applied also to its two chief tributaries). Here, owing to the extreme humidity of the climate and the exceedingly numerous tributary brooks and larger streams, he found that it had already become an enormous river, varying from two thousand to six thousand yards in width, and flowing with a strong current where it was apparently two miles wide; that is, fully equal in magnitude to the river St. Lawrence below Montreal.

This great outflow of water is not surprising when we consider that it is from one of the most rainy regions in the world. Its water-shed he describes as a table land four or five thousand feet in elevation, with mountains rising from it to six or seven thousand feet above the level of the sea. The valleys spongy with moisture, with brooks and streams on an average every two miles, reaching in depth to the calf of the leg and the waist; and forests on the uplands, looking as rank in growth, from the moisture, as the mangrove swamps of the coast. Yet this table land of interior Africa, no doubt owing to its great elevation, is described by Sir Samuel Baker as having a healthy climate, — the uplands suited for the growth of coffee, and the lowlands for that of cotton.

Reverting to the Lualaba, Livingstone's exploration of it terminated not far beyond Lake Kamelondo, a little over four degrees (4° 09′) south of the equator, where the river is, he says, five degrees west from the head of Lake Tanganyika. He afterward reduces this distance as over estimated, and states the river to be between 26° and 27° W. longitude. He turned back at four days' journey above the head of a series of rapids and terrible whirlpools. Fifty miles below this, he says, the Lualaba receives on the west its greatest tributary branch, the Lomami, which, like the Lupira already mentioned, rises at the mound of four fountains, near latitude 12° S., spoken of by Ptolemy, on the authority of ancient Arabian geographers, as yielding two sources of the Nile.

Beyond the entrance of the Lomami, he says, a fourth large lake is formed, which still remains to be explored, — *with many inhabited islands in it* (to which we shall again have occasion to refer). Beyond this lake, he says, it is reported that the river passes into large reedy lakes, forming, he thought, Pertheric's Nile, which joins what is considered the main White Nile, about lat. 10° N., half way down between Gondakora and Khartoum.

In the map published with Stanley's letters, in the New York *Herald*, hastily extemporized no doubt, merely to give a general idea of the waters spoken of, Lake Bangueolo is placed two degrees and a half further north than the latitude given it by Livingstone; and the Lake Victoria Nyanza three-quarters of a degree too far south. In the map published in the London *Illustrated News*, Lake Bangueolo, instead of being made a hundred and fifty miles long, as Livingstone states it to be, is shown as being only seventy-five, and his two great westerly courses of the Lualaba, of a hundred and eighty and a hundred and twenty miles, are shown imperfectly, as giving only one-third of that westing; and lastly, in the map given in Stanley's very interesting book, the Lualaba instead of joining the White Nile as the Bahr-el-Gazal or Pertheric's branch, as Livingstone indicated and believed, is shown as flowing into the Albert Nyanza of Baker, in deference, probably, to Capt. Grant's criticism, showing that the Bahr-el-Gazal was utterly too small to be the Lualaba of Livingstone. But the Lualaba, which Livingstone makes two thousand feet above the sea level, where he left it, cannot well flow into the Albert Nyanza, which is three thousand feet nearly above the sea (2,700 by Baker), especially as it has to descend the fifty miles of rapids Livingstone speaks of before reaching Gondakora, which Baker makes to be nineteen hundred feet above the sea.

These remarks are not made in a spirit of captious criticism, but to show the difficulty of dealing with the Lualaba on the supposition of its being a branch of the Nile at all, and also the very general and indefinite character of the data scattered through the great mass of interesting information acquired by Mr. Stanley, and contained in Livingstone's own letters. As to that, I speak from experience, for though familiar with hydrographic difficulties from having had to deal for nearly thirty years with those arising from very many conflicting and imperfect surveys of the Ottawa and its tributaries, covering an area equal to that of the New England States, taken together, I found that it took protracted study to deduce from that scattered data in his letters, a consistent rough projection of the simplest kind of the waters of Livingstone's Nile.

The discrepancies mentioned may serve to show the great loss to geographical science by the death of Livingstone, who alone was qualified to work up his own observations, and correctly develop the great conclusions his vast personal knowledge of the subject, and experienced judgment enabled him to deduce from them.

Another error of Stanley's, of a different nature, requires correction, especially as it has passed unnoticed by so many of our own newspapers in quoting the statement; that is, his assertion that taking Livingstone's idea to be correct, his great river Lualaba is the main Nile, the Nile is found to be the longest river in the world next to the Mississippi, and second only to it.

That such an error should pass unnoticed is very extraordinary. Every school boy can see that the Nile enters the Mediterranean at latitude 31½° North, and Livingstone shows us that the south shore of Lake Bangueolo must be in latitude 12° South, and its southern feeders must naturally extend half a degree farther south, at least; from which it is obvious that the Nile, from its mouth to the most southerly sources of its waters, would thus extend over forty-four degrees of latitude. He would also see that a direct line from the source to the mouth of the Mississippi is as nearly a north and south line as the same general line of the Nile, and that the two rivers are about equally crooked in their courses; but that the Mississippi extends over only eighteen degrees of latitude, or much less than half the extent of Livingstone's Nile, which Stanley was speaking of. In short, he would find that if the direct length from source to mouth of Livingstone's Nile, spoken of, were laid down over the Mississippi, it would extend over the Mississippi from its mouth to its source, and beyond it, northward, through the whole length of the continent, and two hundred miles further, into the Arctic ocean; in short, that the continent of North America was not large enough in that direction to contain the Nile. Measuring the Mississippi to the most north-westerly source of the Missouri, would make little change in the comparison.

The prevalance of error as to the size of American rivers, and of erroneous tables in our school books which give rise to it, is much to be deprecated if real knowledge be our object.

Livingstone believed that the great river Lualaba, which he discovered, was the Nile, and that in its head waters, those of the Chambezi, he had discovered the long sought sources of the Nile. But there are reasons, all but insurmountable, for believing that he was mistaken; — reasons for thinking that, in discovering this greater river than the Nile, he has found, and bequeathed to science, another mystery as great as that he thought he had solved by that discovery — a mystery like that of the Niger, which occupied public attention so much sixty years ago, another great river for which an outlet to the ocean has to be discovered.

There is also every reason to believe that, though mistaken as to the Lualaba, he, in discovering, on the 2d of April, 1867, that intensely solitary and romantic Lake Liembe, which connects on the east side with the south end of Lake Tanganyika — had, as he then thought, really discovered the true source of the Nile — (if a lake receiving three fine streams apparently as large as the Thames at Richmond, or the Clyde at Glasgow, can be called the *source* of the Nile). Taking it as the source, it still leaves the Nile a course traversing forty degrees of latitude, and that would reach from the Gulf of Mexico to the mouth of Copper Mine river on the shore of the Arctic.

As Lake Liembe is connected by a broad channel with Lake Tanganyika, which by the last reports is discovered to be connected with Baker's Albert Nyanza, forming an uninterrupted lake navigation of about eight hundred miles, Livingstone was apparently right in thinking that in the Liembe and its tributaries, he had discovered the head waters of the Nile; and Baker equally so in thinking he had discovered the great reservoir of the Nile in his Albert Nyanza. These facts will immediately be completely determined by the steel steamers he, Baker, sent up to Ismaal, above Gondakora, to be transported past the rapids to Albert Nyanza.

This connection, now reported to be ascertained between the Lakes Tanganyika and Albert Nyanza, proves that the Arab merchant Hamed's statement is correct, though Speke disbelieved it;* that Tanganyika received a large feeder at the south end (the Liembe with its large river-like outlet), and that there was a still larger river, which he said he saw and felt to be flowing out on his voyage to the north end. Though it escaped Livingstone and Stanley's limited exploration of the north end, this connection, which makes an interesting and important addition to the wonders of the Nile, seems necessarily an absolute certainty; for did it not exist, Tanganyika would necessarily be a salt lake like all others without outlets, as the salts natural to all rivers accumulate by the evaporation of ages in such lakes, but Lake Tanganyika is stated by Speke to be "perfectly sweet."

Lake Liembe is about forty miles long, and eighteen to twenty wide. It lies down in a hollow, with precipitous sides 2,000 feet in height. Livingstone says it is extremely beautiful. Magnificent tropical forests and vegetation clothe the steep slopes of the mountains that surround it, down which broad streams leap in splendid cascades; a natural paradise, where elephants, buffaloes and antelopes feed undisturbed by the natives, whose villages are embowered in palm trees, and who till the land and rear goats on the rocky islands; while hippopotami, crocodiles and fish swarm in the waters.

The solitary and romantic beauty of Liembe seems appropriate to its character as the source of the ancient, great, renowned, mysterious Nile.

When we sum up its characteristics, its unequaled length of course, the magnitude of its lakes, which rival those of the St. Lawrence, the singular importance of its inundations from time immemorial, the number and variety of nations, historical and unhistorical, that occupy, or have occupied its valley, and the overwhelming antiquity and grandeur of the monuments of past civilization on its banks, we find it to be the foremost of the famous rivers of the world.

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* It was not correct. There is no such large feeder as ascertained by Cameron's exploration and discovery of the outlet at the west.

Mighty as Livingstone's Lualaba is as a river, its importance, in public consideration, is chiefly due to the belief that this hitherto "great unknown" river was the Nile. It is evidently necessary now, however, to abandon that idea. We see that it cannot become the Nile, by entering the Albert Nyanza, as represented on the map with Mr. Stanley's book, because to do so would be to ascend nearly a thousand feet. Nor is it the Bahr-el-Gazal, which Baker, on examining, found to be only a mile wide and shallow, with no perceptible current where it joins the Nile, though the latter was flowing at the rate of a mile and a half an hour, vastly the greater stream, and in no greater degree augumented by the Bahr-el-Gazal. As the Lualaba, where Livingstone left it, was a much greater stream than the Nile itself, it is impossible that its waters could join the Nile as the insignificant Bahr-el-Gazal. Some may argue that in the intervening thousand miles of its course to the junction, it may have lost much of its waters by evaporation, or absorption in the low marshy country through which it passed; but by a glance at a rain chart, it will be seen that such evaporation is impossible, as it is the greatest rain region in the world; and as the Nile, though a smaller stream, traverses the same country, where it is an almost boundless marsh, without undergoing any apparent diminution, much less could the Lualaba, a much larger stream, lose its water; and what is equally conclusive, Sir Samuel Baker, after having his attention directed to the question, and with the opportunity his late expedition gave him of satisfying himself about it, informs us, since his return, that there is no large stream enters the Nile on the west side.

This naturally leads to the question: What, then, is this Lualaba of Dr. Livingstone, and where does it go to?

Capt. Grant suggests that it may flow north-westward two thousand miles, and lose itself in Lake Chad; but if the Nile can force its way to the sea through a rainless desert, much more should the Lualaba, a greater stream; or, being twice as great as the Volga, and flowing through an exceedingly more rainy country, it would necessarily have made in the desert a sea greater than the Caspian.

It is altogether unnecessary, however, to have recourse to any of these impossibilities. The Lualaba of Livingstone is absolutely needed to explain the existence of one of the two greatest rivers in the world — the Congo or Zaire, which enters the Atlantic six degrees south of the equator, and has been surveyed up to within about six or seven hundred miles of the point to which Livingstone ascertained the position of the Lualaba. It is true that Livingstone thought he had traced the Lualaba past all the branches of the Congo; but it was the southerly branches of the Congo, whose head-waters he had traversed, that he thought of, without taking into consideration the great, almost unknown north-east branch, which preponderates so in magnitude as to govern the period of highest flood in the Congo.

About sixty years ago I read, in some work that I have forgotten, a statement, by Mungo Park, of his reasons for believing that the Niger discharged its waters through the Congo, stating the enormous volume of that river, which he compared to the Amazon in outflow. Similar arguments in support of the same view appeared in an article in the London *Quarterly* of April, 1815. All these facts and arguments adduced point with double the show of reason to Livingstone's Lualaba, not only because the Niger is already otherwise disposed of, but because the Lualaba is much the nearer, and necessarily the more probable, especially as without the Congo no outlet is possible for the Lualaba, and because the great volume of water discharged by the Congo cannot be accounted for without including the Lualaba as its main stream. This will be apparent when we consider the enormous outflow of water that the Congo pours into the Atlantic.

The reviewer states that it is agreed by all writers who mention this river that it has the remarkable peculiarity of being in almost a perpetual state of flood, varying only about nine feet, while the Nile and the Ganges, inconsiderable streams compared with it, vary above thirty feet, and that its depth probably exceeds that of all other rivers. It has, however, two floods, one, the greatest, beginning in March, and the lesser in September. Its double floods and very moderate variation in height of water the reviewer ascribes to the erroneous hypothesis of its receiving the Niger as a tributary, whereby it would receive, at opposite seasons of the year, the floods of the rainy seasons of the opposite sides of the equator. So it does undoubtedly without the Niger, in a considerable degree; but if it be the Lualaba, as we have reason to believe, its comparative uniformity of condition would be a necessary consequence of the large lakes of the Lualaba already mentioned, just as the great uniformity of the St. Lawrence, compared with other rivers, is the necessary consequence of its great lakes, acting as regulating reservoirs of the waters they receive and discharge.

The review, in a foot-note, gives the discharge of the Zayr (the Congo) into the sea, when at its lowest state, as four millions of cubic feet of water in a second of time, which seems scarcely possible, as that is fully ten times as much as passes over Niagara, as computed by the New York State Engineers, or four times as much as can be allowed for the discharge of the St. Lawrence into the gulf, at Antecosti; still, if the Congo be the Lualaba, which is the only way of accounting for its enormous volume, the area that it drains must be about double that drained by the St. Lawrence; and a glance at a rain chart shows it to be an incomparably more humid and rainy country. Calculations of the discharge of rivers are especially unreliable, however, in estuaries, more or less influenced by tides, and where the current at such enormous depths is unknown, and possibly the surface water only may be fresh. Far from having a bar at its mouth, like feebler streams, Captain Ireby, of the frigate Amelia, found the waters of the Congo flowing perfectly fresh, with a current of four and one-quarter miles an hour out at sea, twelve miles beyond the mouth of the river, and ninety feet in depth. In the entrance, where it is fifteen miles wide and over six hundred feet in depth, he found a constant current of six and one-half to seven miles an hour, of fresh water. This must have been at the time of flood, for Captain Tuckey, in 1870, found the current seldom as much as four and one-half miles an hour, at lowest water, but with the enormous depth of six hundred and eighty feet, without touching bottom. At the head of navigation, a hundred and forty miles from its mouth, the tide is slightly felt when the river is at its lowest, the depth, for the last fifty miles, varying from a hundred and eighty to three hundred feet. Then above this the channel is a narrow gorge, with precipitous banks, and obstructed by rapids and falls for forty miles, with mountains on each side rising to the height of two thousand feet. I quote the results of Tuckey's explorations, because I find, on referring to more modern works, that little or nothing has been added to our knowledge of the Congo, except the position of the head-waters of its south-westerly branches discovered by Livingston. Tuckey, and nearly all of his party, perished by sickness, and it is reported that the expedition sent up the Congo recently, to penetrate to Livingstone, has proved a failure. Tuckey's exploration extended to a hundred miles above the rapids, where the river "presented a most majestic appearance," with a width of two, three and even more than four miles, and a current "from two to three miles an hour." Here, far above the influence of the tide, flowing unobstructed, where its magnitude can be fairly estimated, we have it, at lowest water, a stream apparently about twice as large as the St. Lawrence,* below Montreal, in flow of water; and the native traders informed Captain Tuckey that it was the same size six hundred miles further up.

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*Above Lake St. Peter, where it has still nearly half its tributary waters to

That distance, following the main north-easterly branch, would reach comparatively close to where Livingstone left his great Lualaba, closely resembling it in character and magnitude; in nearly the same latitude south of the equator as Captain Tuckey's exploration of the Congo ended. As it would be absurd to suppose that the Lualaba could be evaporated in the country that give out so enormous a stream as the Congo, and as no naturally admissible outlet can be found for the Lualaba but the Congo, and as the size of the Congo cannot well be accounted for without identifying it with the Lualaba, it seems difficult to avoid believing them to be the same river. Such a conclusion is strongly supported by the accounts given by early Portuguese missionaries and historians, of the time when that nation was justly renowned for its African discoveries.

The reviewer in the *Quarterly* for April, 1815, quotes Barros, who states that the King of Congo (then a kingdom of great extent) received an account of the rebellion of a people who inhabited certain islands in a great lake out of which flows the Zayr (Congo), which runs through the kingdom of Congo. This great lake would seem to correspond, in position as well as character, with the great lake Livingstone speaks of with "many inhabited islands," already mentioned, as being beyond the junction of the Lomami, which is fifty miles down the Lualaba from the point where he turned back.

Capt. Tuckey says that combining his own observations with all that he could collect from the natives he could not help thinking that the Congo would be found to issue from some large lake or chain of lakes considerably to the northward of the line. But here as to the position of the lakes he seems to have been misled by the supposition that the Congo was the Niger. The information given by the old Portuguese and Spanish missionaries alike on the east and west coast of Africa is unquestionably more correct, at least as to the Nile, as now ascertained by recent discoveries. These missionaries speak of the waters of the Nile and the Congo being derived from the same sources; that these sources are large lakes in the *neighborhood of the equator and to the southward of it*, among

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receive, the St. Lawrence narrows to a mile and one-seventh in width, with a depth of forty-three feet mid-stream, at lowest water, and a current of two miles an hour; above that it averages a mile and three-quarters in width. The Mississippi, at New Orleans, is, according to Darby, eighty yards less than half a mile in width, and has a depth of one hundred feet, and a current of three miles an hour at ordinary height of water which Zembre was considered as the "great mother and chiefe ladie of the waters of Africa." Lopes left Rome to visit Congo a second time for the purpose of obtaining full information about the Nile, and by him we are told that the Zayr (Congo) derives its floods from three lakes, the first the Zembre, the second the Zayr, and the third "a great lake out of which the Nile is supposed to proceed." The missionary Marolla speaks of a vast collection of waters from whence one great stream flows through Egypt and the other through the countries watered by the Zayr.

The accuracy of the information as to the sources of the Nile contained in these quotations, as now actually ascertained, gives greatly increased weight to what they contain respecting the Zayr, and recalls the extrordinary knowledge of the true source of the Nile, contained in the immeasurably more ancient Hindu-Puranas, which Sanscrit scholars, as quoted in Baldwin's excellent work on "Pre-Historic Nations," inform us as describing the Nile as taking its rise in the "Lake of the Pods." The country round the lake being called Chandre-st'han or Moonland. Our recent explorers inform us that the country around the lakes at the sources of the Nile is now called "Unyamuezi," or Moonland, which Speke says must have been one of the largest kingdoms in Africa. This ancient Sanscrit description now doubly appropriate, since our most recent discoveries, make Tanganyika and Albert Nyanza one great lake, the identical "Lake of the Pods."

Its vast extent, — its mountains six thousand feet in height, clothed with magnificent tropical vegetation, rank with the humidity of the climate, — and the lofty water falls of the large streams with which their precipitous faces are furrowed, all combine to render the name highly expressive of the emotions of sublimity with which it inspired the mysteriously ancient Cushite fathers of civilization who so designated it; and to whose wonderfully extensive commerce the old Sanscrit writers were indebted for the information.

The reviewer in the *Quarterly* objects to what he calls the notion of the early Portuguese missionaries, that the Congo and the Nile flowed from the same lake or collection of waters (which he thinks they derived from Ptolemy and the ancient Arabian geographers), as being an error of careless observers, if derived even from eye witnesses, and all but impossible in the face of the accepted opinion that two rivers could not flow out of the same lake. We have ample demonstration, however, that they do so in some instances. I, as well as others before me, followed two different rivers flowing in strong rapids, out of the same lake in the Saguenay country, in

Lower Canada. The Ottawa country presents some striking instances of that fact. The whole of the country on the north side of the Ottawa from the mouth of the river Gatineau, opposite the metropolis of Canada, up to the head of Lake Temiscameng, is actually an island two hundred and thirty-two miles long, and a hundred and twenty miles wide; because a lake called Lac des Rapids, at its north end (which is a hundred and forty-five miles a little to the west of north from the city of Ottawa), discharges one river westwardly into the east branch of the Ottawa, and near the same point, sends off another in the opposite direction, which, after a tortuous south-easterly course of ninety miles, enters the Gatineau a hundred and forty miles above its mouth. From this island a lesser one, ninety-miles long and fifty-six wide, is formed by Lake Dumoine sending off two strong rivers, one from each end that enter the Ottawa, one in Lake Temiscameng, and the other more than a hundred miles lower. These facts are not given from imperfect information — they are established by returns of surveys of record in my office.

Thus, though there is much reason to believe that the Lualaba of Livingstone is the Congo, yet, as we see, absolutely, that some lakes do send out rivers in different directions, and that the Lualaba descends apparently to the same flat marshy level from which the Bahr-el-Gazal is known to flow, and as it would be presumptuous to suppose that Livingstone had not some good reason for believing that the Lualaba was connected with the Bahr-el-Gazal, it is quite probable that the early Portuguese missionaries were as correctly informed as to Nile and the Congo flowing from the same lake or waters, as they proved to be as to the Nile flowing from large lakes *on, or south of the equator.*

If there be such a connection, however slight, it is evident that with the least difference in level in favor of the Nile, a very large portion of the water of the Lualaba at high flood, would, owing to the low banks of the Bahr-el-Gazal, necessarily flow into the Nile; and by increasing its floods, and diminishing those of the Congo help to explain why the periodic floods of the Nile rise twenty-five feet at Cairo, and thirty-six feet at Thebes, while those of the Congo rise only from seven to eleven feet, though the Congo is by far the greater river of the two.

If the valley of the Lualaba and its tributaries belonged exclusively to the Nile, and not to the Congo, then the Nile would drain nearly twice as large a portion of the rainy region of the equator, as would, in that case, remain for the Congo, and would necessarily far exceed the Congo in volume; but, as it is known to be very much smaller than the Congo, it is the latter apparently that must receive the main body of the Lualaba's waters, and not the Nile.

If it be true that Livingstone's attendants have preserved his books, as well as his body, we may expect to obtain, before very long, much more complete information as to his discoveries, than we now possess; but, at best, nothing quite equal in value to his own ultimate conclusions, had he lived to compile the results of his life's labors himself.

A life that for long intervals exiled him almost as thoroughly from all that we know as the society of civilized men, as if he had been removed to another planet; — a life eminently devoted to geographical science, but, judging of it by the heroic resolution of his own mind, preëminently devoted to the welfare of the finest portion of the African race, which he has been so successful in bringing under the notice of Christian nations for protection from the terribly destructive inroads of the slave traders who were advancing into their country.

In speaking of the remotest tribes he visited before returning Livingstone tells us that they are industrious cultivators of the soil, and everywhere very honest. Some of them smelt iron and copper and are good smiths. The men are fine, tall, strapping fellows, with nothing of the Negro in their limbs and features; that the women are light colored, have straight noses and finely formed heads, small hands and feet and perfect forms. He says that when the men are at war the women travel all over the country unmolested, a fact much to the credit of their national character. Some of the tribes cultivate and drink coffee, and all but the Manyema cultivate and weave cotton; and he says that the population is prodigiously large, and food of all kinds is abundant and extremely cheap.

When we consider the high type and the capacity and valuable qualities of this interesting race inhabiting, as far as we know, a fertile and magnificently watered country as large as the valley of the Mississippi, we cannot but regard the combined and so far successful action of the English, American and German governments toward suppressing the slave trade of eastern Africa, as highly important in the history of humanity, and creditable to the Christian character and high civilization of these great nations. No doubt this concerted action was chiefly due to the reiterated representations of our heroic explorer and Christian missionary, Dr. Livingstone, whom, Sir Bartle Frere, with language indicative of his own high character, designates as " the greatest and the best of men he ever had the good fortune to meet."

On the same occasion a similar high-minded appreciation of Livingstone led Sir Samuel Baker to describe his own services to science and humanity in Africa as insignificant compared with Livingstone's — an undervaluation of his own great services in which the public will be unable to concur.

Equally creditable also to Stanley is the large-hearted enthusiasm with which he makes the great and good qualities of Livingstone the most prominent subject of his book. In strong contrast to which stands the ignoble and preposterous suspicion of his veracity entertained by some in the face of letters, unquestionably written by Livingstone, to those who could not be mistaken as to their being genuine. The testimony of Dr. Livingston's son and Earl Granville's letter on the subject are conclusive as to that, and the letter communicating the thanks of Her Majesty Queen Victoria and the handsome memorial she presented to Mr. Stanley are appropriate tokens of the appreciation his gallant achievement merited.

Stanley was already an experienced traveler, but in his search for Livingstone he has shown himself to be a man of extraordinary determination and executive ability. In his frank and ably written work, "How I found Livingstone," besides presenting a vivid and highly interesting view of the physical aspect and social condition of the interesting region he traversed in his thirteen months of travel, he has brought prominently before the vast multitude of ordinary readers a magnanimous and faithful portrait of the noble character of that heroic traveler he was so successful in finding, together with an instructive summary of his recent great discoveries, such as the public generally would have otherwise been long of obtaining, especially now that Livingstone has not survived to publish his own discoveries.

Speaking of the value of Stanley's mission and services points equally to his patron, Mr. Bennett, to whose magnanimity and unstinted liberality the enterprise was due.

The public will look with much interest for the publication of Livingstone's latest journals when they are received, as well as those contained in the large sealed parcel brought home by Stanley. And should Lieut. Cameron succeed in tracing the Lualaba from the remotest point on it reached by Dr. Livingstone to its outlet, as he proposes in his letter of the 17th of October, 1873, from Unyanyembe, he will have the merit of solving one of the most interesting problems of physical geography.

Though I have to apologize for much that may be stale and prolix in this article I trust that it may be found in some degree interesting to those who are not already better acquainted with the subject.